

**Amendments To The Claims**

This listing of claims will replace all prior versions, and listings of claims in the application.

Please amend claims 1, 4, 5, 12, 31, 34, 35, 41 and 56 as follows:

Claim 1 (Currently Amended): A method of storing data in a database, comprising:  
obtaining both a protocol encoded raw form of a data to be stored and a syntax-normalized form of said data; and  
storing concurrently in at least two entry tables both the syntax-normalized form and the protocol encoded raw form of said data.

Claim 2 (Previously Presented): A method of storing data in a database, as claimed in claim 1, wherein said obtaining comprises:

first obtaining a protocol encoded raw form of a data and thereafter generating said syntax-normalized form from said protocol encoded raw form of the data.

Claim 3 (Previously Presented): A method of storing data in a database, as claimed in claim 1, wherein said storing comprises:

maintaining both the syntax-normalized form and the protocol encoded raw form of the data for data base searching and data retrieval.

Claim 4 (Currently Amended): A method of storing data in a database, as claimed in claim 3, wherein said maintaining comprises maintaining said protocol encoded raw form and syntax-normalized form of a data in at least two entry tables.

Claim 5 (Currently Amended): A method of storing data in a database, as claimed in claim 4, wherein said maintaining further comprises correlating the storage location of said protocol encoded raw form and said normalized form in said at least two entry tables.

Claim 6 (Withdrawn): A method of storing data in a database, as claimed in claim 2, wherein said generating step comprises:

applying directory service attribute syntax rules to the raw data.

Claim 7 (Withdrawn): A method of enabling data to be arranged and/or stored in a database used in a directory service system, the method including the steps of:

- a. applying directory service attribute syntaxes rules to the data, and
- b. creating a normalised form of the data.

Claim 8 (Withdrawn): A method of enabling data to be arranged and/or stored in a database as claimed in claim 7, further comprising:

- c. storing said data and the normalised form of the data concurrently in at least one table.

Claim 9 (Withdrawn): A method of enabling data to be arranged and/or stored in a database as claimed in claim 8, wherein said at least one table comprises a plurality of columns and a plurality of rows, and said storing step comprises storing said data and said normalised form of the data in related locations.

Claim 10 (Withdrawn): A method of enabling data to be arranged and/or stored in a database as claimed in claim 9, wherein said locations in a table are related by being in a common row.

Claim 11 (Withdrawn): A method of enabling data to be arranged and/or stored in a database as claimed in claim 8, wherein said at least one table comprises a HIERARCHY table and an OBJECT table.

Claim 12 (Currently Amended): A method of locating data in a database, wherein said data is stored in at least two entry tables in a protocol encoded raw form and linked to a concurrently stored syntax-normalized form of the data, comprising:

locating said protocol encoded raw data by searching on said syntax-normalized form of the data.

Claim 13 (Withdrawn): A method of locating data in a database, as claimed in claim 12, wherein said searching is performed using SQL.

Claim 14 (Withdrawn): A method of locating data in a database, as claimed in claim 12, wherein said searching is performed on an OBJECT table, comprising a plurality of columns and a plurality of rows.

Claim 15 (Withdrawn): A method of locating data in a database, as claimed in claim 14, further comprising for a data entry:

specifying an attribute ID (AID), said AID being stored in a first one of said plurality of

columns and in a predetermined row;

storing an entry ID (EID), said EID being stored in a second one of said plurality of columns and in said predetermined row;

storing a normalised form of said data entry in a third one of said plurality of columns and in said predetermined row.

Claim 16 (Withdrawn): A method of formatting a find request for a database having stored therein objects including attributes each having a type and value(s), the method including:

- a. creating a database representation of the type (AID), and
- b. creating a database representation of the value(s) (NORM).

Claim 17 (Withdrawn): A method as claimed in claim 16, wherein step a. is performed by looking up an ATTRIBUTE table.

Claim 18 (Withdrawn): A method as claimed in claim 16, wherein step b. is performed by applying syntax normalization.

Claim 19 (Withdrawn): A method of locating objects stored in a database, the method comprising the step of applying AID and NORM to determine a matching object (EID), wherein the method of claim 16 is used to determine AID and / or NORM

Claim 20 (Withdrawn): A method of locating objects stored in a database, the method comprising the step of applying AID and NORM to determine a matching object (EID), wherein the method of claim 17 is used to determine AID and / or NORM

Claim 21 (Withdrawn): A method of locating objects stored in a database, the method comprising the step of applying AID and NORM to determine a matching object (EID), wherein the method of claim 18 is used to determine AID and / or NORM

Claim 22 (Withdrawn): A method of locating objects stored in a database, the method comprising the step of applying AID and NORM to determine a matching object (EID).

Claim 23 (Withdrawn): A method as claimed in claim 22 wherein the step of applying is performed using SQL.

Claim 24 (Withdrawn): A method of retrieving contents of object(s) from a database, the method including the step of:

- a. finding row(s) which match a predetermined EID(s).

Claim 25 (Withdrawn): A method as claimed in claim 24, further including the step of:

- b. returning from the row(s), EID, AID and a raw form.

Claim 26 (Withdrawn): A method as claimed in claim 25, further including the step of:

- c. converting the result of step b. into objects containing attribute(s), each attribute having a type and value(s).

Claim 27 (Withdrawn): A method of providing data as an output from a database, the output being in response to a directory service/query, the method comprising the steps of:

processing said directory service/query to identify said data in the database; and  
providing as the output, a raw form of the data.

Claim 28 (Withdrawn): A method of providing data as an output from a database, as claimed in claim 27, wherein said processing step is based on other than said raw data.

Claim 29 (Withdrawn): A method of providing data as an output from a database, as claimed in claim 28, wherein said processing step comprises a comparison of data directly corresponding to said raw data but in normalised form.

Claim 30 (Withdrawn): In a directory service system, having a database in which data is stored in a first form, and a second form, being a normalised form, a method of transferring data into and out of the database, the method including the steps of:

finding data in the database using a normalised form; and  
transferring data out of the database using a raw form.

Claim 31 (Currently Amended): A database apparatus comprising:  
means for obtaining both a protocol encoded raw form of a data to be stored and a syntax- normalized form of said data; and

a storage medium for storing concurrently in at least two entry tables both the syntax- normalized form and the protocol encoded raw form of said data.

Claim 32 (Previously Presented): A database apparatus for storing data in a database, as claimed in claim 31, wherein said means for obtaining comprises:

means for first obtaining a protocol encoded raw form of a data and thereafter generating said syntax-normalized form from said protocol encoded raw form of the data.

Claim 33 (Previously Presented) A database apparatus for storing data in a database. As claimed in claim 31, wherein said storage medium is operative to maintain both the syntax-normalized form and the protocol encoded raw form of the data for data base searching and data retrieval.

Claim 34 (Currently Amended): A database apparatus for storing data in a database, as claimed in claim 33, wherein said storage medium is operative to maintain said protocol encoded raw form and syntax-normalized form of a data in at least two entry tables.

Claim 35 (Currently Amended): A database apparatus for storing data in a database, as claimed in claim 34, wherein said storage locations of said protocol encoded raw form and said syntax-normalized form of data are correlated in said at least two entry tables.

Claim 36 (Withdrawn): A database apparatus for storing data in a database, as claimed in claim 32, further comprising:

means for applying directory service attribute syntax rules to the raw data.

Claim 37 (Withdrawn): An apparatus for enabling data to be arranged and/or stored in a database used in a directory service system, comprising:

- a. means for applying directory service attribute syntaxes rules to the data;
- b. means for creating a normalised form of the data; and

c. means for storing said data and the normalised form of the data concurrently in at least one table.

Claim 38 (Withdrawn): An apparatus for enabling data to be arranged and/or stored in a database as claimed in claim 37, wherein said at least one table comprises a plurality of columns and a plurality of rows, and said storing step comprises storing said data and said normalised form of the data in related locations.

Claim 39 (Withdrawn): An apparatus for enabling data to be arranged and/or stored in a database as claimed in claim 38, wherein said locations in a table are related by being in a common row.

Claim 40 (Withdrawn): An apparatus for enabling data to be arranged and/or stored in a database as claimed in claim 37 wherein said at least one table comprises a HIERARCHY table and an OBJECT table.

Claim 41 (Currently Amended): An apparatus for locating data in a database, wherein said data is stored in at least two entry tables in a protocol encoded raw form and linked to a concurrently stored syntax-normalized form of the data, comprising:

means for locating said protocol encoded raw form of the data by searching on said syntax-normalized form of the data.

Claim 42 (Withdrawn): An apparatus for locating data in a database, as claimed in claim 41 wherein said searching is performed using SQL.



Claim 43 (Withdrawn): An apparatus for locating data in a database, as claimed in claim 41, wherein said searching is performed on an OBJECT table, comprising a plurality of columns and a plurality of rows.

Claim 44 (Withdrawn): An apparatus for formatting a find request for a database having stored therein objects including attributes each having a type and value(s), the apparatus including:

- a. means for creating a database representation of the type (AID), and
- b. means for creating a database representation of the value(s) (NORM).

Claim 45 (Withdrawn): An apparatus as claimed in claim 4,, wherein said means for creating is operative to create a representation by looking up an ATTRIBUTE table.

Claim 46 (Withdrawn): An apparatus as claimed in claim 45, wherein said means for creating is operative to create the data base representation by a means for applying syntax normalization.

Claim 47 (Withdrawn): An apparatus as claimed in claim 44 is operative to determine AID and / or NORM.

Claim 48 (Withdrawn): An apparatus as claimed in claim 45 is operative to determine AID and / or NORM.

Claim 49 (Withdrawn): An apparatus as claimed in claim 46 is operative to determine AID and / or NORM.

Claim 50 (Withdrawn): An apparatus as claimed in claims 46, wherein the means for applying uses SQL.

Claim 51 (Withdrawn): An apparatus for locating objects stored in a database, the apparatus comprising means for applying AID and NORM to determine a matching object (EID).

Claim 52 (Withdrawn): An apparatus as claimed in claim 51, wherein the means for applying uses SQL.

Claim 53 (Withdrawn): An apparatus for retrieving contents of object(s) from a database, the apparatus comprising:

- a. means for finding row(s) which match a predetermined EID(s).

Claim 54 (Withdrawn): An apparatus as claimed in claim 53, further comprising:

- b. means for returning from the row(s), EID, AID and a raw form.

Claim 55 (Withdrawn): An apparatus as claimed in claim 54, further comprising:

- c. means for converting the output of the means for returning into objects containing attribute(s), each attribute having a type and value(s).

Claim 56 (Currently Amended): In a directory service system, having a database in which data is stored in at least two entry tables in a first form, being a protocol encoded raw form, and a second form, being a syntax-normalized form, apparatus for transferring data into and out of the database, comprising:

means for finding data in the database using a syntax-normalized form; and

means for transferring data out of the database using a protocol encoded raw form.

Claim 57 (Previously Presented): A computer program product, including a storage medium for storing a computer program, the computer program being executable to perform a method as claimed in any one of claims 1-5.

Claim 58 (Previously Presented): A method as claimed in any one of claims 1-5 wherein the protocol encoded raw form of data is stored in ASN.1 format.

Claim 59 (Withdrawn): A directory service system as claimed in any one of claims 30 and 56 wherein the raw form of data is stored in ASN.1 format.

Claim 60 (Previously Presented): An apparatus as claimed in any one of claims 31-35 and 41 wherein said protocol encoded raw data or data is stored in ASN.1 format.

Claim 61 (Cancelled)